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REPORT

OF THE

Louisiana Conservation Commission

OF

1910

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Letter of Transmittal

To his Excellency Jared Y. Sanders, Governor of Louisiana:

Sir—The Louisiana Commission for the Conservation of Natural Resources, created under Act number 144 of the Legislature of 1908, in accordance with the directions therein contained, has the honor to transmit its report.

This is the first investigation of Natural Resources of Louisiana, and necessarily the sources of information are not as numerous, or accurate, as they will be in time, especially if the work of Conservation is continued to be brought to the attention of the people, and the data collected by the different Departments of the State Government.

We have nothing of similar character in this State to guide us in this report; nevertheless, the Commission feels that it has compiled herein practically accurate information; and that it has been able by reason of public meetings, and by the help of a foresighted press, to do a great deal in the way of awakening the people to the necessity of giving their attention to the rapid decrease of Natural Resources.

The general recommendations of the Commission will be found in conclusion of the report. It is enough to say here, that the general interest stimulated in Conservation, and the work done in setting the public mind to thinking on this great subject are, alone, sufficient to justify the expense that the State has been at in this work so far.

Very respectfully,

H. E. Hardtner, Chairman.
H. P. Gamble, Secretary.
W. E. Glassell.
S. R. Lee.
J. F. Denechaud.

Ex-officio:
F. M. Kerr,
Chief of State Engineers.
W. R. Dodson,
Superintendent of State Experimental Station.

PREFACE.

The information herein contained has been acquired by the members individually, by the Commission in session, through the appearance of informed persons before it, and from official departments of the State.

Aside from the information acquired by the Commission in session and individually, there has been submitted special data and instructive matter as follows, viz:

On Water Resources and Swamp Land Reclamation, from Major Frank M. Kerr, Chief of State Engineers;

On the Oyster Supply, by Hon. L. J. Dossman, Chairman of the Oyster Commission;

On Forest Resources, from Fred J. Grace, State Forester, and from J. H. Foster, United States Forestry Expert;

On Agricultural Soil Resources, from Prof. W. R. Dodson, Superintendent of Louisiana's Experimental Stations.

The subject of Mineral Resources is treated from matter drawn from many sources.

FOREWORD.

On the General Subject of Conservation.

A realization that the Natural Resources of the Nation were being rapidly consumed, and, what is most important, needlessly wasted, has only been brought home to the people within the last three or four years.

The rapid decrease in forests, without any provisions being made for reproduction, was the first thing to open the eyes of thinking men. It has now come to be generally admitted that our national progress, and the continued well being of the Nation, and we almost say the perpetuation of our form of Government, depends on the condition, that each generation shall so use the Resources of the country as not to leave the succeeding generation bankrupt.

It is now agreed that there must be a reform in the methods of using natural riches; that it is time to take an inventory of these riches; and to stimulate by a proper education of public opinion, and to force, by prudent legislation, a wiser use of these riches in the future.

Good citizens should be made to understand, and indifferent ones forced to agree, that. to use the language of one of the Nation's practical great men:

"Money spent in care for the life and health of the people, in protecting the soil from erosion and from exhaustion, in preventing waste in the use of minerals of limited supply, in reclamation of deserts and swamps, and in the preservation of forests still remaining, and the planting of denuded tracts—money invested in these and in the developing of water ways, and the deepening of harbors, is an investment yielding an annual return. *If any of these expenditures fail to bring a return at once, the money expended is like a bequest to those who come after us.* And as a parent lives for his child as well as for himself, so the good citizen provides for the future as well as for the present."

Detached interest in conservation was first brought together at the Conference of Governors which was called by President Roosevelt to meet at the White House on May 13th-15th, 1908. In the letter calling the Conference together, these significant paragraphs were used:

"My Dear Governor: * * * Recently I declared there is no other question now before the Nation of equal gravity with the question of the conservation of our Natural Resources, and I added that it is the plain duty of us who, for the moment, are responsible to take inventory of the Natural Resources, which have been handed to us, to forecast the needs of the future, and so handle the great sources of our prosperity as not to destroy in advance all hopes of the prosperity of our descendants.

"It is evident that abundant Natural Resources on which the welfare of this Nation rests are becoming depleted, and, in not a few cases are already exhausted * * * * *.

"Facts, which I cannot gainsay, forces me to believe that the conservation of our Natural Resources is the most weighty question now before the people of the United States. If this is so, the proposed conference, which is the first of its kind, will be among the most important gatherings in our history in its effect on the welfare of all our people.

"I earnestly hope, my dear Governor, that you will find it possible to be present.

"Sincerely yours,
(Signed) "THEODORE ROOSEVELT."

In response to this invitation the Conference was held, and the fact that it was not only attended by the Governors of the States, but by the most distinguished men in every walk of the nation's life, all agreeing on the transcendant importance of the subject, produced a profound impression on the nation.

Men like James J. Hill, the Railroad Magnate; Andrew Carnegie, John Mitchel, the Miner, and John Hays Hammond, from the industrial lines, and thinking men like Cardinal Gibson, William Jennings Bryan, President Charles Elliot, of Harvard, joined in sounding the alarm, and calling on the nation to take notice of the Conservation Problem.

The subjoined declaration was unanimously adopted by this conference of Governors, practical workers in the nation's industries, and philosophical thinkers and educators:

DECLARATION.

''We, the Governors of the States and Territories of the United States of America, in conference assembled, do hereby declare the conviction that the great prosperity of our country rests upon the abundant resources of the land chosen by our forefathers for their homes, and where they laid the foundation of this great nation.

''We look upon these resources as a heritage to be made use of in establishing and promoting the comfort, prosperity and happiness of the American people, but not to be wasted, deteriorated, or needlessly destroyed.

''We agree that our country's future is involved in this; that the great national resources supply the material basis upon which our civilization must continue to depend, and upon which the perpetuity of the nation itself rests.

''We agree, in the light of the facts brought to our knowledge and from information received from sources which we can not doubt, that this material basis is threatened with exhaustion. Even as each succeeding generation from the birth of the nation has performed its part in promoting the progress and development of the Republic, so do we in this generation recognize it as a high duty to perform our part; and this duty in large degree lies in the adoption of measures for the conservation of the natural wealth of the country.

''We declare our firm conviction that this conservation of our natural resources is a subject of transcendent importance which should engage unremittingly the attention of the nation, the States, and the people in earnest co-operation. These Natural Resources include the land on which we live and which yields our food; the living waters which fertilize the soil, supply power and form great avenues of commerce; the forests which yield the materials for our homes, prevent erosion of the soil, and conserve the navigation and other uses of the streams; and minerals which form the basis of industrial life, and supply us with heat, light and power.

''We agree that the land should be so used that erosion and soil wash shall cease; and that there should be reclamation of arid and semi-arid regions by means of irrigation, and of swamp and overflowed regions by means of drainage; that the waters should be so conserved and used as to promote navigation, to enable the arid regions to be reclaimed by irrigation, and to develop power in the interests of the people; that the forests which regulate our rivers, support our industries and promote the fertility and productiveness of the soil should be preserved and perpetuated; that the minerals found so abundantly beneath the surface should be so used as to prolong their utility; that the beauty, healthfulness and habitability of our country should be preserved and increased; that sources of national wealth exist for the benefit of the people, and that monopoly thereof should not be tolerated.

''We commend the wise forethought of the President in sounding the note of warning as to the waste and exhaustion of the natural resources of the country, and signify our high appreciation of his action in calling this conference to consider the same and to seek remedies therefor through co-operation of the Nation and the States.

''We agree that this co-operation should find expression in suitable action by the Congress within the limits of and coextensive with the national jurisdiction of the subject, and, complimentary thereto, by legislatures of the several States within the limits of and coextensive with their jurisdiction.

''We declare the conviction that in the use of the national resources our independent States are interdependent and bound together by ties of mutual benefits, responsibilities and duties.

''We agree in the wisdom of future conferences between the President, Members of Congress and the Governors of States on the conservation of our natural resources with a view of continued co-operation and action on the lines suggested; and to this end we advise that from time to time, as in his judgment may seem wise, the President call the Governors of States and Members of Congress and others into conference.

''We agree that further action is advisable to ascertain the present condition of our natural resources and to promote the conservation of the same; and to that end we recommend the appointment by each State of a commission on the conservation of Natural Resources, to co-operate with each other and with a commission of the Federal Government.

''We urge the continuation and extension of forest policies adapted to secure the husbanding and renewal of our diminishing timber supply, the prevention of soil erosion, the protection of headwaters and the maintenance of the purity and navigability of our streams.

''We recognize that the private ownership of forest lands entails responsibilities in the interests of all the people, and we favor the enactment of laws looking to the protection and replacement of privately owned forests.

''We recognize in our waters a most valuable asset of the people of the United States, and we recommend the enactment of laws looking to the conservation of water resources for irrigation, water supply, power and navigation, to the end that navigable and source streams may be brought under complete control and fully utilized for every purpose. We especially urge on the Federal Congress the immediate adoption of a wise, active and thorough waterway policy, providing for the prompt improvement of our streams and the conservation of their watersheds required for the uses of commerce and the protection of the interests of our people.

''We recommend the enactment of laws looking to the prevention of waste in the mining and extraction of coal, oil, gas and other minerals with a view to their wise conservation for the use of the people, and to the protection of human life in the mines.

''Let us conserve the foundations of our prosperity.''

Following this Conference, and no doubt in accordance with its recommendation that each State create a Conservation Commission, this Commission was created by Act 144 of the Session of the Legislature of Louisiana of 1908.

Section 2 of that Act reads: "That it shall be the duty of the Commission provided for in Section (1) of this Act to inquire into and report on the forest conditions of the State of Louisiana, with reference to the preservation, the reforesting of denuded land, the effect of the destruction of forests, on climatic conditions and water ways and their control; the drainage and reclamation of swamp land, and the prevention of waste in the extraction of oil, gas and other minerals, and generally on all matter pertinent to these subjects; to report to the General Assembly the result of such investigations, to advise what legislation for the conservation of Natural Resources may be advisable, and perform such other duties as may be incidental thereto."

THE KINDS OF RESOURCES.

In the outset the Commission agrees that there are two kinds of Resources—exhaustible and inexhaustible. Examples of the exhaustible classes are minerals like oil, gas, sulphur, salt and coal. Of this class of Resources new supplies naturally come only from new discoveries, because reproduction by the processes of nature are so slow that it may be left out of consideration. With reference to this class of Resources the fact that they are exhaustible, emphasizes the necessity of stopping waste and making the best use possible of the supplies now in existence.

The other class of Resources referred to as inexhaustible, are not of necessity inexhaustible, but only so in case they are properly used and conserved, and with reference to the forests, reproduced.

Among those resources which, if conserved, may be classed as inexhaustible are the land, the water and the forest. The fertility of soil is conserved by replacing those elements which are annually withdrawn by the crops raised on them; the soil itself is conserved by not permitting it to be washed away in floods. The waters are conserved by not permitting them to become filled with the silt washed from the land, and by protecting the springs and headwaters of their sources. The forests are conserved by economical use of those forests which are standing, and by reproducing them when removed. The conservation of land, water and forests are universally admitted to be closely allied.

By reason of the fact that the natural riches of our nation have been so very abundant, and the further reason that as a people we have been using those resources to an appreciable extent for less than a century, we have almost fallen into that attitude of mind, which without thinking, blindly supposes that what we have always had in abundance, that will we always have in abundance; no matter whether we, ourselves, take any steps to reproduce or to conserve.

Fortunately as above observed we are, as a people, beginning to awaken. However, there are many individuals everywhere to whom the importance of Conservation has not been brought home; and many other individuals who, perhaps realizing this importance, yet believe that their greatest profit lies not in conserving, but in destroying to the uttermost.

The first class of individuals referred to, waste because they have not been informed of better methods, and because they are doing now what they have always done.

The second classe of individuals are those who knowingly waste for present personal profits, and are careless of the consequences to the public, and to future generations. Pre-eminent among this class are the lumbermen. The great majority of these consider that their profit lies in skinning the land of every sapling, careless whether the great product which they have removed may be ever reproduced. By occupation this class of industrial workers are those who most frequently have little permanent interest in the locality where they operate, and this may be the main reason why they are indifferent to the consequences of their destruction.

Perhaps the oil producers may, to some extent, be classed among those who waste much to get little, though this is not so clear as in the case of the lumbermen.

Among those who do not conserve or reproduce from want of information or warning, education must be disseminated.

In the case of those who look alone to their own profit, totally regardless of the public welfare, the law must enter in behalf of the public, and regulate the operations of this class.

The operator in Natural Recources, who operates solely for his own profit and without regard to the effect of his operations on the public welfare, proceeds on the theory that what he has bought and paid for, he may do with as he pleases. He is wrong.

It is a principle of law necessarily adopted by men when they associated themselves together in government, that the right of any individual must necessarily be limited by the rights of his fellow individual. To say that a man may do what he pleases with his own is denied in a thousand ways, not only by law, but by custom and even by public opinion.

On this particular question President Roosevelt, in his address to the Governors' Conference at Washington in May of 1908 stated:

''The opinion of the Maine Supreme Bench sets forth unequivocally the principle that the property rights of the individuals are subordinate to the rights of the community, and especially that the waste of wild timber land, derived originally from the State, involving as it would the impoverishment of the State and its people, and therefore defeating one great purpose of government, may properly be prevented by State restrictions.

The Court says that there are two reasons why the right of the public to control and limit the use of private property is peculiarly applicable to property in land. First, such property is not the result of productive labor, but is derived solely from the State itself, the original owner; Second, the amount of land being incapable of increase, if the owners of large tracts can waste them at will without State restriction, the State and its people may be helplessly impoverished, and one great purpose of government defeated. * * * * * The Court of Errors and Appeals of New Jersey has adopted a similar view, which has recently been sustained by the Supreme Court of the United States. ''The State,'' says Chief Justice Holmes, ''has a standing in Court to protect the atmosphere, the water and the forest within its territory, irrespective of the assent or dissent of the owners of the land most immediately concerned.''

The Commission believes that there is a remedy against waste and destruction in restrictive legislation, and enlightened public opinion. However the enactment of the legislation depends largely on the enlightment of public opinion.

In this respect the Commission believes that it has made a good beginning. It has held numerous meetings in different sections of the State, and has had prominent individuals and associations to discuss matters pertaining to conservation before it. It has taken steps, through the kindness and foresightedness of the press, to give the widest publicity to conservation discussions, in order to stimulate and arouse a forceful public opinion, and with much success. Reference to legislation will be found in the conclusion.

MINERALS.

The mineral resources of Louisiana afford a large, and for the most part, valuable and important variety. Among those which will be hereafter mentioned in detail, are oil, gas, sulphur, salt, gravel and brick clays, all of which are being commercially used, and productive of extensive commercial operations. Also there is lignite, pottery clays, sand stone, marls and others that are at present not of commercial importance, though they may become so later.

SALT.

Salt has existed in saline form, as well as rock form, in Louisiana since very early days.

There is an artesian salt well in Winn parish known to have been sunk before the Civil War, and from the water of which salt was made up to 1860; there were salt works in Bienville parish as early as 1840, also on Cotton bayou and on Lake Bisteneau, in Sabine parish, and in Catahoula. Most all of these were worked, but to no large extent, by extracting the salt from the water.

Since the discovery of salt on what is known as the Five Islands, on the Gulf of Mexico, in solid rock form, near the surface, the extraction of salt from water in the above named localities has ceased.

On Avery's Island, large deposits of pure salt rock were discovered in 1862, since that time hundred of thousands of tons of pure rock salt has been mined at this point. Nearly a thousand tons per day are now produced.

It is reliably reported that in 1895 salt was discovered on Jefferson's Island, and that there was a boring through 1,800 feet of pure salt. This deposit is not yet developed.

In the year following, pure rock salt was located at Belle Isle, and the mines are now being operated to the extent of several hundred tons per day.

Myles & Co. have since 1897 been mining several hundred tons of salt per day from their works on Weeks Island.

It can be claimed for Louisiana that her salt deposits rank second among the great deposits of the earth.

In other sections of the State salt is found from 100 to 200 feet from the surface, in a pure state, and is from thence several hundred feet in thickness. Taking the production already developed in Southwestern Louisiana with the possibilities of developing the once used field in North Louisiana, it is safe to say that Louisiana has a lasting resource in salt, and one that is productive of great commercial benefit to the State.

SULPHUR.

Calcasieu parish bears the distinction of having the richest sulphur mine in the world. The sulphur is brought to the surface from a considerable depth by a method not known before this mine was worked. Superheated water is forced into the sulphur beds through pipes, the sulphur being heavier than water, falls to the bottom, and is then pumped through a smaller pipe inclosed in the large one, through which hot water was forced. On the surface the hot sulphur is thrown into large tanks where it is solidified, broken up, and shipped. At times several acres adjoining the sulphur works are covered with solid sulphur. This mine produces in the neighborhood of one thousand tons daily. The owners estimate from borings that they have at least 40,000,000 tons in deposit, or more than a hundred years' run.

In boring for oil in Winn parish, and other sections of the State strong sulphur water has been encountered, and it is believed that there will be revealed yet valuable sulphur deposits in other sections.

LIGNITE.

Lignite of very fine quality and in large quantity has recently been uncovered in the Dolet Hills. Analyses were recently made with the following average composition: Water, 32 per cent; volatile matter 34 per cent; fixed carbon, 31 per cent; ash, 3 per cent. Thermal value with 15.2 per cent moisture is 9783 B. T. U.

Geographical investigations show that this formation underlies a large part of Northwestern Louisiana, with numerous out crops from the Ouachita to the Sabine. In Sabine parish, on Sabine river, and in Winn parish on Saline bayou there are beds over five feet thick. Other prominent out crops are near Mansfield, Many and Shreveport.

LIMESTONE AND MARBLE.

Limestone and marble out crops are found at Winnfield. Coochie Brake, Bayou Chicot and other places in the State. All of these out crops can be easily used for the manufacture of lime, since analyses show them to be nearly pure carbonate of lime. Much of this limestone can be used for building purposes.

Near Winnfield, in Winn parish, the Southern Mineral and Land Company have erected a huge plant for crushing this limestone, which they ship in enormous quantities for building and concrete purposes. It is the opinion of the experts in this line of work that we may soon expect large cement works to be carried on in connection with the operation of these limestone quarries, by reason of the cement qualities of the stone.

Indeed, the men who have invested their money in enterprises at Winnfield expect that after they get well beneath the surface, where they have heretofore worked, they will find a good class of marble, susceptible of a high polish. In any event the limestones and marbles of Louisiana will be productive of large commercial operations.

CLAY.

In the Grand Gulf hills white clays are found which will doubtless make excellent pottery.

Brick kilns, both large and small, are located in every section of the State. Particularly at Shreveport, and at Slidell, are large quantities of brick manufactured.

GRAVEL.

Gravel, as railroad ballast, and for use in towns and cities for streets, is a valuable deposit. Extensive beds are located in Ouachita parish, Grant parish, Webster parish, LaSalle parish, East Baton Rouge and in smaller quantities elsewhere.

OIL.

The discovery of the famous Beaumont oil field in 1901 was the signal for oil exploration both in Texas and Louisiana.

Since that time Louisiana has proven to have within her borders oil deposits second only to the famous Pennsylvania fields. And the deposit in the Caddo field, of Caddo parish, is probably generally regarded as the greatest single field in the world.

The depth at which oil is found varies from 500 to 2,200 feet in the different fields.

The Welsh field in Calcasieu parish produces oil at about one thousand feet. There is now being produced at this field 100 barrels per day. One hundred acres will probably cover the area of production.,

The Jennings field in the same parish produces oil at from 1,700 to 1,900 feet, and there is said to be generally no cap rock. A large percentage of salt water has been brought up with oil in this field. The wells now flowing or being pumped are producing 10,000 barrels per day. The oil is shipped by pipe line to the Southern Pacific Railroad. This field covers and area perhaps of three hundred acres. The production per well has varied from 50 to 1,200 barrels per day.

The Anse-La-Butte field has not been the success that the Welsh and Jennings fields have, though oil is produced in paying quantities, and it is yet expected that there will be a further development in that field.

There are other numerous localities in the State in which the seekers for oil have explored, with more or less success. Notable among them is three miles from Winnfield, where borings were begun over seven years ago, and continued intermittently for that time. Thick rock has been encountered and probably accounts for the difficulty in proving the field. Colfax, Alexandria, Monroe and Bienville are other places where oil has been prospected for, but with little success as yet.

However, when oil production is spoken of in Louisiana at this time the thought flies to the

CADDO OIL FIELDS.

In Caddo parish, twenty-five miles north of the City of Shreveport, beginning two or three miles south of Mooringsport, on either side of the Kansas City Southern Railway, and running thence in a northerly direction along the same line of railway probably a distance of fifteen miles and four miles wide. This territory by land description is found in Townships nineteen, twenty, twenty-one and twenty-two, Ranges fifteen and sixteen west, the principal center of production being within three or four miles radius of Oil City along the range line between Ranges fifteen and sixteen west in Township twenty.

The Posey well No. 1, one mile northeast of Vivian was dry, but there is, along a line two miles south of that point, running four or five miles east and west, small producers of heavy oil. Passing south over the Kansas City Southern Railway beyond the dry territory in Section two, to the vicinity of Lewis a few small producers are met with from the same sand that occurs in the Vivian wells. Across James bayou, in Sections twenty-two and twenty-seven, heavy oil, with gas and salt water are met with. From Pine Island to Mooringsport the territory is generally productive. So far, however, there is little encouragement to sink wells over a mile west between Ranges fifteen and sixteen west. Sections two, three and eleven, north of Ferry (Caddo) Lake, and Section thirty-two to the south have proven unproductive; likewise wells near and to the south of the land between Townships nineteen and twenty. Little oil has been found over a mile east of Mooringsport. But four miles east of Oil City in Section ten, five miles northeast of Mooringsport, there is a good well, producing from one hundred to four hundred barrels daily. Section eighteen, one mile southeast of Oil City, seems not only to be the central part of the largest developed area, but it also yields oil in many instances of superior quality. Nearly all of the oil in the Caddo field is found at a depth varying from 2,175 to 2,265 feet.

The Oil Investors' Journal reports the following production from this field:

1906	4,650	barrels.
1907	48,266	barrels.
1908	513,504	barrels.

And it is estimated that the yield for 1909 was near 750,000 barrels.

The geologist investigating this field in 1908, in an article to the Oil Investors' Journal for November in that year, wrote as follows:

"It is a most important fact to note that this field is not one of extreme local concentration. It has nothing in common with the Beaumont or Jennings fields, but every thing, save age, with those of Western Pennsylvania, West Virginia, Ohio and Illinois. Its vastness speaks well for both quantity of oil and gas and the longevity of the field."

The first real successive deep wells were brought in in 1908. In September of that year the C. G. O., on the Gilbert tract, came in with a daily production of four hundred barrels of light oil. Producers' Nos. 1 and 2 were soon brought in, showing high grade oil, and larger quantities than furnished by the Gilbert well. The Guffey-Hostetter No. 2 was brought in in December, 1908, and produced about three hundred barrels daily. The most authentic information gives Producers' No. 2 as the best well, beginning with the production in September, 1908, of one thousand barrels per day, and running at the rate of five hundred barrels daily as late as March, 1909.

Up to and including the year 1909 practically all shipments had to be made by the Kansas City Southern Railway. Loading racks were established at Caddo, Oil City and Mooringsport. Now a six-inch pipe has been constructed from the Caddo field to Grigsby's Island, just south of Shreveport. This will permit of railway shipments over at least a half dozen roads, as well as water transportation on the Red river. The Standard's pipe line running from Oklahoma to its refinery at Baton Rouge passes through the Caddo field, and it is expected that in the near future this line will be tapped in order to afford shipping facilities for the Caddo oil.

In January, 1909, the Conservation Commission of Louisiana, by the direction of the Governor, visited the Caddo oil field for the purpose of investigating the reported waste of gas in that field.

From the investigations of the commission, it appeared that in the production of oil, there was a great consumption of natural gas, and in that connection the question arose as to whether or not it is to the interest of the State that such a waste of gas should be permitted in this field, as so observed, both in the so-called "Wild Gas Wells" and in securing oil from the smaller producing wells. This matter will be referred to further on in this report. Suffice it to say at this point that the commission got the impression that the gas interests and the oil interests were not altogether agreed as to their respective methods of operation and particularly did the gas interests complain that the oil field was being exploited at a great and unnecessary sacrifice of natural gas.

From what has been said with reference to oil in the State of Louisiana, it is easy to be seen that it is one of our greatest natural resources, and has been the means of bringing millions of dollars to the State by way of investment. Perhaps $10,000,000 is a conservative estimate. Lands in the neighborhood of productive fields have increased in value over a large area. In many cases land has been sold as high as one thousand dollars per acre. One property in Caddo parish paid its owner as royalty for one month's production of oil over five thousand dollars, while the lessee obtained forty thousand dollars.

The Caddo Levee Board has received from leases of its oil lands to oil companies since December 18, 1909, one hundred and twenty-three thousand dollars ($123,000.00).

Most oil men believe that the oil industry in this State is in its infancy.

GAS.

It may be said with perfect truth that there is not any given section in the State of Louisiana, fifty miles in diameter, but what natural gas may be found flowing from the surface. This has been observed for a great many years in the past. It has frequently happened, before the oil fields were being explored, that in boring wells for artesian water strong gas flows were found. This was true of Southwest Louisiana, Central Louisiana, as at Colfax and Winnfield, and in Northwest Louisiana, but no commercial use was made of this product until the enormous gas deposits of the Caddo field were discovered.

Gas in immense quantities seems to have, in the opinion of many qualified persons, a more general distribution than oil in the Caddo field. From Mooringsport north to Vivian and from west of James bayou east to Dixie, gas has been found in enormous quantity. This field first attracted the attention of the general public by its famous burning gas wells in about May, 1905. Well, known as Producers' No. 2 "blew out" in that year with terrific force. The gas caused the water in and about the well to present a boiling churning motion, that loosened up the earth some yards around the well, engulfing the derrick and machinery in a mass of liquid earth. A few days after the "blow out" the gas was ignited and thereafter for five months this geyser attracted visitors from all parts of the country. Major Frank M. Kerr visited the well in behalf of the State in 1906 to see what might be done to stop the waste of gas; and, in his report to the Governor, says in part:

"On the day of this visit the well presented a scene of magnificent energy and surprising spectacular effect. A basin or bowl of water some two hundred and fifty feet in diameter has resulted from the action of the escaping gas, and the roll of the waves from the mouth of the orifice toward the rim of the basin is like waves on a sea beach in stormy weather, from the center of which leap a flame some thirty feet in diameter and equally high. This, with the monster upheaval of water and leaping of spray, presents a spectacle which might readily have been likened to display of a prismatic fountain of unusual magnitude and superb effect."

Producers' No. 3, in the same vicinity, repeated the history of No. 2 in a somewhat milder form during the latter part of 1906 and early part of 1907.

Caddo Gas and Oil Company's well No. 1, on the Gilbert tract, in the east part of Section thirteen, perhaps two hundred yards west of the railroad and about one and a quarter miles south of Caddo City, has had a remarkable history as a geyser. After a period of over three years of constant eruption it still appears vigorous. This well when lighted raises the water to the boiling point, and produces an action similar to that described by Major Kerr above.

Another famous burning well was that known as Dawes Trustee No. 1. In May, 1908, this well blew out at a depth of about fourteen hundred feet, wasting forty million cubic feet of gas per day under very high pressure. While preparing to kill the well the derrick was completely destroyed by a cyclone. Deeper gas worked out through the eight and one-quarter inch casing in a defective seam, or under the bottom, and started the

800 foot or Caddo gas stratum to blowing out. It in turn worked through a split in the ten-inch pipe twenty feet below the surface and blew out a very large hole about twenty feet deep around the top of the ten-inch pipe. Strong efforts were made to kill this well, but the gas caught fire and burned from June, 1908 to the night of January 12, 1909. The gas was lighted the next morning, but went out again within five minutes. Some salt water appeared and with the gas forms a spray that still rises above the old hole. This well was the one which was referred to in the Conservation Commission's report to the Governor in January, 1909, as the Dry Burning Gas Well.

The gas of the Caddo oil field has been utilized for domestic and manufacturing services by pipe lines from the field, both into Shreveport, Marshall, Tex., and into Texarkana. A six-inch pipe line carried the gas into Shreveport in May, 1906, where it was sold for thirty-five cents per one thousand cubic feet, for domestic purposes, and for one-half that price for manufacturing and general power purposes. In 1907 another line was laid into Shreveport from the field. In 1908 an eight-inch line carried the gas north from Lewis to Texarkana. There is stated to be sold now from the Caddo field about 15,000,000 cubic feet of natural gas daily.

Much has been said with reference to an undertaking to carry the natural gas of Caddo into New Orleans, a distance of probably four hundred miles, over bayous, swamps and the Atchafalaya and Mississippi rivers. This is a tremendous undertaking and would probably require an expenditure of nearly ten million dollars. The proposed price for this product in New Orleans was from thirty-five to forty-five cents per thousand cubic feet.

It has even been mentioned that St. Louis is a possible market for Caddo field gas.

It may readily be seen, therefore, that this enormous deposit of gas is a valuable resource of the State, and that it is of the utmost importance to conserve it, and prevent waste so far as is possible with justice to the oil interests in the same field.

On account of the great waste of this product, referred to above in speaking of the wild wells, and in connection with the production of oil, there was a general demand that the Conservation Commission investigate the subject, and if possible propose some remedy. Accordingly the Conservation Commission met in Shreveport in February, 1909, by order of the Governor, to investigate and report on the subject of gas waste in that field. This report was made to the Governor and will not now be included herewith in detail. In that report it is stated:

''The commission was enabled not only to examine the wild wells, but observed very clearly that the gas waste is not alone confined to these, but that gas is escaping and wasting in enormous quantities from the producing and abandoned oil wells.''

Subsequent to visiting the fields the commission held a hearing at Shreveport, the headquarters of the oil and gas drillers, operators and experts, on the 4th day of February, and in its report to the Governor said:

''The commission obtained at these hearings valuable, though on some points conflicting, information.''

Some of the oil operators declared that the gas was not wasted in the field to secure oil. And contrary opinion was expressed by the gas operators. And it was stated on the authority of the gas experts that there was an average daily waste in the field of seventy million cubic feet. For illustration, the waste in twenty-four hours was said to equal the amount necessary to supply two such cities as New Orleans and Dallas combined for a similar period.

In reference to the wild wells it was claimed that upwards of twenty thousand dollars had been expended in an attempt to control them, without effect.

At this hearing it was outspokenly charged that oil production in the field was being exploited at the expense of the gas store, and with a selfish disregard to the public interest in conserving the supply. It was even charged that as between the different gas interests, some of the interests operating at a distance from the Oil City field were selfishly interested in discouraging the feasibility of stopping the waste in that vicinity with the view that if that field were exhausted it would redound to the benefit of the more remote fields.

With reference to the wild wells referred to, it having been published in the papers that the State would close them, the commission received numerous propositions from persons and companies in this State, and others, to the effect that they would undertake to stop the waste of gas for sums varying from twenty to fifty thousand dollars, the amount not to be collected until success was had. The commission was not authorized, nor were there any funds available to expend in this work.

The commission reported that there was every reason to believe that the Caddo Gas fields are the greatest yet discovered; that in their possession this State has a source of natural wealth of inestimable value to the commercial interests and one that should be productive of large taxable values in the way of manufacturing plants and enterprises incidental to gas consumption; that the investment of capital in such manufacturies and enterprises, almost altogether depend on the control and conservation of the gas supply, and that the apparent indifference of this State to the waste now going on had been a cause of actual discouragement to prospective investors in such enterprises.

There has been a waste of many millions of cubic feet daily in numerous sections of the State, where artesian wells have been bored and abandoned, and in other sections where a small amount of oil is produced at an expense of a great deal of gas. But the greatest waste observed, as heretofore reported, is in the Caddo field. Experts, and among others a geogolist of the United States Government, estimated that there was seventy million cubic feet of gas escaping daily from the Caddo field alone in 1908, from the wild wells, and from the abandoned non-producing oil wells, and from the producing oil wells. Gas men say now the figures will reach 200,000,000 cubic feet. The oil men say not more than 75,000,000 feet.

On the basis that thirty thousand cubic feet of gas is equal to one ton of coal, the waste alone in the Caddo field, if not more than 70,000,000 feet, is equal to 2,250 tons per day. If one were inclined to express this loss in terms of car lengths of coal it is seen that during the year 1908 alone the waste was fully equal to a solid train of coal reaching from New Orleans, La., to Marshall Tex. Perhaps men are not much impressed with this waste, for the reason that gas is invisible; if an amount of coal equal in value to the escaping gas were to be burned in any section of the State, benefiting none, this waste being visible to the eye of men, would be immediately put to a stop.

On a basis of three cents per thousand cubic feet at the well (and the pipe lines sell it in Shreveport for thirty-five cents per thousand cubic feet for domestic use, and seventeen and one-half cents for manufacturing and power purposes), there was a waste of natural gas in the Caddo field in 1908 of $1,200,000. Be it remembered that this waste, almost as great all the time, and greater some of the time, has been going on since 1905.

Should this waste be permitted to continue?

Can this waste be stopped without doing injury of equal amount to private interests?

As stated by the Commission in its report, gas waste in Louisiana has not been a matter of entire indifference to the State heretofore.

The Legislature of 1906 passed an Act, the purpose of which was intended to meet such a situation as exists in Caddo fields and other similar fields of the State where there might be negligence and indifference to gas waste. The Act provides that the State, after making a vain demand on owners, could, through its Engineering Department, take possession of the abondoned wells where the gas was left to waste, and stop them, appropriating enough of the adjacent property to cover the expense. It provided also for punishing negligent and criminal waste of the gas.

Unfortunately in this latter connection, it appears that there is no person directly charged in looking after the public interest in the enforcement of the law. It was expected that persons in interest in the field would complain to the courts of negligence and demand prosecution. Such has not been the case. During the past three years in which the greatest waste has been going on, not a single complaint has been made to the authorities of the State in accordance with the terms of the law, upon which the State could proceed, until within the last few days (in the first days of May, 1910).

It is a matter of common knowledge that there is a sentiment among men that in a matter concerning the common interest, the common interest should be looked after by persons selected for that purpose, and that private persons should not be relied upon to bear the responsibility and odium, if any, of looking after the public business.

In the light of the experience, and for the protection of the natural gas resource of this State, and for the protection of the oil development, and for the advancement of both of these interests on behalf of the people of the State, it is recommended that the laws now on the State books with reference to gas and oil production, looking to the prevention of waste in both, should be strengthened, and that the State should provide an officer, well informed in connection with both of these interests, paid by the State, whose duty it would be to see that the laws should be obeyed. The Indiana statute, with modifications to meet Louisiana conditions, is recommended.

WATER.

The subject of water with reference to conservation is principally important in this respect. Wherever there are hills and valleys there are watersheds and water courses, and nothing we can do can prevent the rains from falling upon the hills running down to the valleys and passing off in streams and rivers into the ocean; but we can change the speed of water flow into the drainage basins. Where the slopes of drainage basins have been cleanly cleared, the floods have been disastrous, and the floods are followed by a drouth, because the hills which are naturally the reservoirs of the streams have run dry. France has a saying, "No forests, no rivers," just because this is so.

By cutting the forests clean and thereby removing from the surface of the earth the cover made by the shade, the falling leaves and other forage, the flow of water is run off rapidly, not sinking into the earth to make the springs, and at the same time washing the soil away in such quantities as to choke up navigation.

There has been a revival in interest with reference to the possibilities of navigation all over the nation. And it may be safely said that water navigation is going to assume a much larger place in the transportation of the country than it has occupied heretofore. The necessity for the development of our waterways is emphasized by the fact that any considerable future reductions in the cost of rail transportation are improbable. There has been no appreciable decrease in railroad rates in foreign countries, where railroads are much more fully developed than in this country, where labor is cheaper and capital much more plentiful; consequently it does not seem proper to expect the reductions here.

This development of water navigation will take the course, so far as the State is concerned, of prevention. The State government may materially promote navigation by preventing, so far as is possible, soil erosion and the consequent choking up of the streams.

No State in the Union equals Louisiana in its amount of alluvial lands, and in its mileage of navigable waters. The State next to Louisiana in its amount of navigable water is Arkansas, and it falls fifteen hundred miles short.

As was observed, the number of miles of streams in Louisiana, either navigable, or easily susceptible of improvement for navigation exceeds that of any State in the Union. It aggregates some 3,800 miles.

In addition to this the State has some 500 miles of coast line, lapped by the waters of the Gulf of Mexico.

However, of the 3,800 miles of streams traversing the State, not more than about 2,500 miles may, at this time, be, in their present condition, strictly classed as navigable.

This is due largely to deterioration resulting from overflows in the past, vegetable decay and deposits, obstructions from the growth of timber, promiscuous felling and falling of timber, fords, low bridges, accumulations of drift and any number of other abuses which, with the passage of time, are unwittingly ignored, if not invited by communities in their failure to take that "stitch in time" which later "saves nine."

With proper treatment and regulation, however, there are few, if any, of these at present disused channels which may not be rectified for navigation for one kind of craft or another.

In the Gulf of Mexico, the State offers a port to the world at innumerable points along its shore.

Drainage: Along similar lines, while many of our streams still offer and afford magnificent opportunities and conditions for carrying along the drainage of the State, too large a proportion by far have ceased to perform their functions in that respect.

The remark is often heard, in many directions, that the drainage of the State, as a general proposition, appears to grow less effective with each recurring year. This is true. And why should it not be? How many communities, not to speak of individuals, have, in all the years gone by, reflected, or, in fact, are at the present time reflecting upon the abuses being constantly and continuously visited by them upon their natural drainage ways, by neglecting to remove vegetable growth, guard against timber, dead trees, limbs, etc., falling in and accumulating in them, and by constructing low bridges to arrest drift, etc., etc.?

And what is true about the natural drainage ways is also largely true of the artificial drainage ways from time to time, here and there, constructed at great outlay.

Irrigation: Not only does this same large array of streams in Louisiana, under proper treatment, present such possibilities for navigation and drainage, as above outlined, but for irrigation as well.

Due to a bountiful annual, well distributed rainfall, some 54 inches per annum, there are few localities in the State where water in abundance cannot be brought to pumps by the numerous streams treading their way in almost every direction, here and there, and almost everywhere within its limits, where such streams have been conserved in their original natural state, or may have been restored to conditions equally favorable.

But not alone to rainfall and waterways need the State depend for its supply of water for irrigation. Most satisfactory results have almost invariably followed in the greater number, if not all localities in the State, from wells, where so far attempted.

Domestic Uses, Manufactures, Etc.: Properly safeguarded against pollution, the waters of the State compare favorably in nature with the best in the country, while such as contain impurities, in the form of suspended matter, or from alkalinic or acidic contamination, respond readily to treatment.

Power: With some rather few exceptions to be found, possibly on Red river, and some of its branches, the development of power from the flow of water in the streams of Louisiana, except from artificial heads, raised by other power, can hardly ever be relied upon. The slope of all the streams in the State, regarded from the standpoint of power, are, with very few exceptions, too flat to produce the requisite velocities of current.

Reviewing the foregoing, then, the question arises as to what may be the remedy against abuses in one direction, and what should be the foundation for improvement in the others?

The answer, it would seem to us to be, legislation; clear, concise, sweeping legislation to compel conservation measures along all the lines touched upon.

Where a stream be navigable, United States law is supreme—when and where enforced. This enforcement, however, is too often dependent upon the degree of local appreciation in which governmental restrictions are held in communities, and their consequent failure many times to encourage the government's good offices.

On matters of drainage, the State has already passed much law—much that is good, bad and indifferent, and little that, in a broad sense is comprehensive, practical and effective.

A review of these would take up too much space in any report possible at this time, and avail little. The point, rather, is to consider and determine what should be salient features of a drainage law, or laws, drawn on broad lines, present.

To exemplify this, we do not think we could well do better than to quote from a paper prepared and read by Major T. G. Dabney, Chief Engineer of both the Upper Yazoo Levee District and the Tallahatchie Drainage District, in Mississippi, at the Drainage Convention of the Fifth Louisiana Levee District, held at Tallulah, La., March 11, 1909, viz:

''In formulating a drainage law, here are the first two essentials: First, to lodge sufficient power in a controlling body to do *things;* and, second, to give this body sufficient funds to do them with. This is the 'law and the prophets' of drainage propositions.

''The State of Mississippi has a general drainage law for the whole State, patterned after the drainage law of Illinois. A very dilligent effort was made to develop one small drainage district in Coahoma county, Mississippi, under this general law. Two formidable difficulties presented themselves; first, there was no provision for revenue until after a great delay of expensive work had been done; and, secondly, the Drainage Commission for the county had to consult the private views of too many individuals before action could be taken.

''The law that was afterward framed and passed by the Legislature to organize the Tallahatchie Drainage District, sought to avoid these difficulties, by recognizing the principle that in order to accomplish any important work a great deal of arbitrary power to act must be lodged somewhere, and funds must be provided upon which to act.

''This law was framed along the lines of our levee law, in so far as the analogies of the case would permit. The controlling body is a commission of representatives from all the counties in the drainage district, appointed by the Governor of the State and confirmed by the Senate. The law makes it the duty of the commission to go ahead and drain the country. They are not to ask this man, that, and the other, if he wishes his land drained; they are not to wait for petitions to be presented for drainage; they are required to go forward and do the necessary drainage work, and can only be prevented by counter petitions in favor of drainage. And such possible obstructive petitions can apply only to local drainage; nobody can stop the construction of main trunk drainage canals.

''In every extensive drainage project there are three classes of work to be done, and there should be three separate sources of revenue to meet those requirements.

''First, the preliminary surveys, including the laying out of drainage systems, and the work of general administrations.

''Second, the construction of main trunk drains through the main drainage basins.

''Third, the construction of secondary drainage systems in the subdivisions of the main drainage basins, these secondary systems discharging into the main trunk drains.

''The territory of the district is to be divided into main drainage basins, if the physiography of the country requires such divisions. Each main drainage basin is entirely independent of all others.

''The main drainage basins are then subdivided into what are called in our law, for the sake of designation, *Drainage Units,* according to the topography of the country. Each drainage unit is independent of all other drainage units, except that they all have community of interest in the main trunk drains of that main basin into which all of them discharge their water.

''In providing revenue for these three classes of work, it must be borne in mind that there is an essential difference in the function of taxes levied for building levees from those imposed for the work of constructing drains to drain a district. Levee taxes are in their nature general, and the benefits from them are general. Every dollar expended on any part of a line of levee is of benefit to all parts of the territory protected by that line of levee. But the benefits resulting from drainage are essentially local, inhering to the particular land that is drained, and not extending, except indirectly, to any other land. Some land is benefited much more than other by the same drainage system; and on the other hand it costs much more to drain some sections of a drainage district than others. It follows that taxes imposed for the construction of drains should be levied on the specific lands to be drained, in proportion to the specific benefits and to the cost of drainage.

''The first class of work mentioned in the above category, that of engineering and administration, is in its nature general, affecting equally the whole drainage district. This work must be done before a basis of revenue can be reached upon the betterment tax principle. And it is essential that a general fund be speedily provided for this preparatory work of a general nature. In the Tallahatchie drainage law this is efficiently met by a general and uniform acreage tax on all lands in the district, with authority for the Drainage Commission to borrow immediately on the faith of the acreage tax, such a sum as may be necessary to carry forward the work of making the surveys and of general administration. The money so borrowed is on short-time loans of one and two years.

''The second class of work mentioned, that of constructing the main trunk drain, is provided for by a bond issue for each main drainage basin, supported by a sufficient betterment tax on all the land tributary to the main trunk drains, according to relative benefits, assessments to be made after all the lands have been surveyed, mapped and classified, and the cost of the main drains ascertained.

''The third class of work, that of developing the individual drainage system of each drainage unit, is also provided for by a separate bond issue for each unit, based upon a similar specific betterment tax upon the lands of the drainage unit, superimposed on the tax levied for the main trunk drains, and differing in amount as between the drainage units, in accordance with the differing costs of constructing the drains in each.

''All bonds are to be issued by and in the name of the Drainage Commission; but the bonds for each main basin, and those for each drainage unit, are to be discharged by the specific taxes levied for that purpose upon these several divisions and subdivisions.

''In the framing of the Tallahatchie drainage law an unwise provision crept through in the final revision of the act, which ought to be avoided in other such acts. This provides that the acreage tax may be applied in part to the construction of the main trunk drains, and that the proceeds of bond sales may, on the other hand, be applied to paying general expenses.

"These two classes of funds are essentially different in their sources and purposes, and their functions are not properly interchangeable.

"The expenditure of any part of the general fund for digging drains in any particular locality is so obviously liable to partiality and abuse that the Tallahatchie Drainage Commission fund is expedient to allay objections raised against this provision of the law by passing a resolution declaring that their policy would not be to so apply any part of the acreage tax.

"In the work of developing the drainage district, the mode of procedure is, first, a detailed topographical survey of the whole territory, and a map showing all of the physical features of the country. A careful study of the hydrological features of the problem is of course necessary, which involves the ascertainment of the volume of water to be carried by each drain channel.

"The main trunk drains are then to be laid out and their cost computed. Then should follow the laying out of the individual unit systems of drainage, to be discharged into the main trunk drains.

"Then the land is to be classified for assessment, and the map should be made in such detail as to show clearly and to demark the different characters of land to be so classified."

This outline is clear, concise and sweeping, meets the issue openly and forcibly, and would form a most excellent basis for the General Assembly to work upon.

So much for the law as to drainage districts. But, in our opinion, a power higher up is further needed to insure the carrying out of the law from inception to close, in the interest not only of communities but of the State at large, to insure which demand State supervision, State direction, and State control.

How may this be incompassed? By some form of State body superior to Boards of Commissioners of Drainage Districts, no proposition to enjoy the privileges incurred by law upon drainage districts organized for drainage purposes to be sanctioned until submitted to and approved by the State body.

Drainage, in the sense presented in the foregoing, refers only to that class or form of drainage demanded by the higher lands of the State, as distinguished from marsh lands, where opportunities in the former for disposing of the surplus water affecting them depends solely upon slope and natural and artificial channels free from obstructions. Of this class, by far the greater area of the State is composed.

Another very important form of drainage, or rather reclamation, is that comprehended in freeing areas of water by surrounding them with embankments, traversing them with canals and ditches and pumping. These are what are known as marsh lands, of which there are also several million acres. Drainage of this class, however, in the very nature of things, due to the general location of the areas affected, differs materially from the other in its relations to the State at large. In fact, it is either entirely independent of, or a disturbing factor, to the other, and, except in so far as the latter may prevail, would call for independent or separate legislation.

Others, however, more intimately acquainted with the requirements of law that should govern this class or form of drainage have also been asked for advice in regard to proper legislation about it, the benefit of learning which we would prefer to enjoy before attempting any further details on these lines.

In regard to regulating the use and supply of water for irrigation, when not already covered by law there would appear to be little doubt but that provision should promptly be made for protection against undue waste, rights of way, seepage, improper drainage, pollution, water rates, etc.

For its utilization for domestic purposes, manufactures, etc., there is an unlimited supply of water practically everywhere in the State.

It cannot be disguised, however, that the development and building up of the State is tending to bring about conditions along and in many of its streams that cannot help but seriously impair the purity, healthfulness and general value of their waters by pollution.

Against these conditions the fost farreaching and most stringent law or laws should be passed and rigidly enforced.

There being but small probability that the use of water in this State, in the development of power, is likely to assume anythink like definite or extensive proportions, now or in the near future, it would not appear of any special moment to discuss it further at this time.

Agricultural Resources

The necessity for conserving the agricultural resources of the country has not been recognized generally until quite recently, and is just now beginning to be realized by our own people. This problem has received official recognition as one of vital interest to the nation by President Roosevelt. On March 14, 1907, he appointed the Inland Waterways Commission, and, under the leadership of Gifford Pinchot this commission forcefully called attention to the necessity of protecting and insuring the permanency of the basis of the nation's prosperity. This resulted in a call from President Roosevelt for the Governors of the various States and Territories to meet him in Washington ''to consider the question of conservation and use of great fundamental sources of wealth.'' President Roosevelt delivered to this conference of Governors a most forceful address, from which we take the following quotation:

''This conference on the conservation of natural resources is in effect a meeting of the representatives of all the people of the United States called to consider the weightiest problem now before the nation; and the occasion for the meeting lies in the fact that the natural resources of our country are in danger of exhaustion if we permit the old wasteful methods of exploiting them longer to continue.

''With the rise of people from savagery to civilization and with the consequent growth in the extent and variety of the needs of the average man, there comes a steadily increasing growth in the amount demanded by this average man from the actual resources of the country. Yet, rather curiously, at the same time the average man is apt to lose his realization of this dependence upon nature.

''This nation began with the belief that its landed possessions were illimitable and capable of supporting all the people who might care to make our country their home; but already the limit of unsettled land is in sight, and indeed but little land fitted for agriculture now remains unoccupied save what can be reclaimed by irrigation and drainage. * * *

"Finally, we began with soils of unexampled fertility and we have so impoverished them by injudicious use and by failing to check erosion that their crop-producing power is diminishing instead of increasing. In a word, we have thoughtlessly, and to a large degree unnecessarily, diminished the resources upon which not only our prosperity but the prosperity of our children must always depend.

"We have become great because of the lavish use of our resources, and we have just reason to be proud of our growth. But the time has come to inquire seriously what will happen when our forests are gone, when the coal, the iron, the oil and the gas are exhausted, when the soils shall have been still further impoverished and washed into the streams, polluting the rivers, denuding the fields, and obstructing navigation. These questions do not relate only to the next century or to the next generation. It is time for us now as a nation to exercise the same reasonable foresight in dealing with our great natural resources that would be shown by any prudent man conserving and widely using the property which contains the assurance of well-being for himself and his children." * * *

Before the conference was concluded the Governors formulated expressions on the subject and presented them to the President, from which we make the following quotation:

"We agree that the land should be so used that erosion and soil-wash shall cease; and that there should be reclamation of arid and semi-arid regions by means of irrigation, and of swamp and overflowed regions by means of drainage; that the waters should be so conserved and used as to promote navigation, to enable the arid regions to be reclaimed by irrigation, and to develop power in the interests of the people; that the forests, which regulate our rivers, support our industries and promote the fertility and productiveness of the soil, should be preserved and perpetuated; that the minerals found so abundantly beneath the surface should be so used as to prolong their utility; that the beauty, healthfulness and habitability of our country should be preserved and increased; that sources of natural wealth exist for the benefit of the people, and that monopoly thereof should not be tolerated. * * *

"We agree that further action is advisable to ascertain the present condition of our natural resources and to promote the conservation of the same; and to that end we recommend the appointment by each State a commission on the conservation of natural resources, to co-operate with each other and with any similar commission of the Federal government.'' * * *

During the month of June following the conference above referred to, President Roosevelt appointed the Commission on the Conservation of the National Resources, expecting the various Governors to appoint similar commissions representing the various States, with whom the national commission should cooperate. The President directed that the work should ''be organized in four sections to consider the four great classes of water resources, forest resources, resources of the land and mineral resources.''

Louisiana, less than many of the other States, has seen occasion to feel alarmed over the wasting fertility of her soil and the consequent disaster that it foreshadowed to her people. We have grown up with the idea that when our lands became exhausted, we could clear more, but this time is rapidly passing and in the future the average farmer must make his living from the same soil that was cultivated by his father. The available land for immigration in the West and North has been almost all taken up and the tide of immigration will soon turn toward Louisiana and the surrounding States. We must soon add to our cultivable domain by reclaiming large tracts of swamp lands and marsh lands by drainage to meet the demands of our growing population.

Conservation of soil is of the greatest ultimate importance in Louisiana. While our timber and mineral resources are extensive, we must rely on the soil for permanent prosperity and wealth. Our mineral resources must, of necessity, gradually diminish. Our forests must decrease, even under good management, while our cultivated lands must become more extensive, and the producing power increased to provide for a rapidly increasing population and give adequate remuneration to the farmer, who must have more money with which to pay for the farm equipment and home comforts that a progressive age makes necessary. We have often pursued the ''mining'' process of farming, seeking the greatest immediate return from the soil, without regard to its future productiveness, until we are spending today approximately $2,500,000 for fertilizers to maintain our yields.

Cotton has been, until last year, the leading money crop for many years. Disregarding the low average yields of the past two years, which have been due to devastation of the boll weevil, as well as adverse weather conditions, and we find our average yields, taken in ten-year periods, have decreased somewhat, though not greatly, during the past thirty years. However, we were not using commercial fertilizer to any considerable extent thirty years ago.

In general the same statement will hold good for our other two great staple money crops, sugar and rice. Even our alluvial soils are showing the effect of heavy drains on soil fertility, and our sugar planters are using large quantities of fertilizer to maintain their yields.

It is the universal verdict of experts in farm management that under a good system of farming soils may be made to last forever, and even grow increasing crops with increasing profits to the owner. It is therefore a matter of utmost importance to the public welfare that unnecessary dissipation of soil fertility should cease, and these features of farm practice that increase the producing power of the soil be inaugurated as rapidly as possible.

The farmer may be the constructive manufacturer of wealth. The man who mines our salt, sulphur, oil or other mineral products is simply taking away what the Creator has given us, and it is gone forever. Man cannot replace it. The State may or may not have benefited in the way of gathering a small tax from non-resident parties engaged in harvesting her God-given wealth, the money return of which goes largely to augment the fortunes of the capitalists of large cities of other States, who withdraw their operating capital when the source of natural wealth is exhausted, and their imported skilled laborers and managers return to the States from whence they came. With the farmer it is a different story. The farm is his home. All that he has is visible and taxable. His profits are reinvested about him. The State benefits by his prosperity, and suffers in his adversity. He may follow the practice of the miner and rob his soil as rapidly as possible, and abandon it, but he cannot do so with the same dispatch, as nature refuses to yield all the soil's fertility to one or even a few crops. If the soil gradually becomes poor, the owner becomes poor with it. On the other hand, we know that some of the oldest agricultural lands in the world, that have been devoted to crop production for centuries, have greater producing power now than at any period in their past history. We know that the producing power may be maintained and increased in Louisiana, without detriment to immediate interests.

Of the 28,000,000 acres of land in the State, less than 6,000,000 are in cultivation. Probably more than 20,000,000 can be profitably put under cultivation. Of the total domain about 13,000,000 acres are of alluvial origin. Probably 75 per cent of this area can be put in cultivation by levee protection and a reasonable expenditure for drainage. These alluvial lands are among the most fertile in the world, and should be worth from $50 to $100 per acre when reclaimed and when accessible to transportation facilities. In fact, some of the reclaimed marsh lands are so rich in decomposing vegetable matter that the nitrogen content is from 10 to 100 times greater than that of many very productive soils. The Experiment Station has analyzed samples of these soils that ran in the neighborhood of 2 per cent nitrogen, or one-fourth as rich in nitrogen as cotton seed meal. For a short distance transportation this soil could be profitably utilized as fertilizer on ordinary soils. We do not know very much at the present time about the composition of soils that have been formed from the deposition of decomposing vegetable matter throughout the vast stretches of so-called marsh prairies of Southwest Louisiana. But in a portion of this territory firm soil is located at a depth of two and a half to three feet below this surface stratum of peaty soil that forms a good foundation for the construction of levees for the protection of land that may be reclaimed.

Any legislation that may be passed looking to the encouragement of the investment of capital in the development of this territory would result in the ultimate development of an exceedingly prosperous country throughout that extensive territory that is now unproductive, and from which the State derives no revenue. These soils, when reclaimed, are suitable for the production of sugar cane, corn, rice and many of the staple truck crops.

Vast areas of low-lying lands along our principal rivers and bayous may be put under cultivation with the expenditure of a comparatively small amount of money when drainage enterprises are taken up on sufficiently large scale. We commend very earnest consideration of such legislation as will be submitted to the General Assembly for the furtherance of drainage enterprises.

The alluvial lands situated nearest the banks of our larger streams in the southern portion of the State are devoted largely to the production of sugar cane, the acreage being, according to the last report of the Commissioner of Agriculture, 437,000 acres, yielding a product of 664,668,050 pounds of sugar and 436,392 barrels of molasses, valued at approximately $28,000,000 with a half-million dollars worth of syrup.

We believe it is conservative to say that through an expenditure of not exceeding $25.00 per acre the sugar producing territory could be extended ten-fold, and thus produce enough sugar to supply the present population of the United States. Whether or not it would be profitable in the immediate future to greatly extend our sugar-producing area, is a matter of opinion in which well informed men differ; certain it is, however, that this land once reclaimed could be devoted to almost any crop of this climate that seemed to offer good profits, and would sustain a prosperous people.

At the present time our profits in sugar production would be larger were it not for the losses of canes and deterioration of sugar content due to injuries from the sugar cane stalk borer, and the sugar cane beetle. It is estimated by those who have made a survey of insect damages, that these two insects cause a loss of a million dollars or more annually to our sugar crop in Louisiana. The Experiment Stations have worked out the life history of these pests, however, and their ravages could be very greatly reduced if not almost eliminated by concerted action on the part of the planters in following out comparatively inexpensive and practical methods suggested by the stations.

Fungus diseases of cane of rather a serious nature have recently been found for the first time in Louisiana. We have extensive commercial relations with other sugar producing countries that have insect pests and fungus diseases not yet found upon our crops, which lends emphasis to the necessity of making ample provision for maintaining inspection and quarantine service for the prevention of further introduction of insect pests and fungus diseases of all of our crops.

The alluvial areas adjacent to the upper Mississippi, the Ouachita and Red rivers, with their tributaries, have in the past been devoted principally to cotton. Last year 1,234,000 acres were devoted to this crop, producing about 266,000 bales. In 1904 we have 1,745,000 acres in cotton and produced 1,089,000 bales, our largest crop. The advent of the boll weevil should not be regarded as wholly of evil import to agriculture. The practice of selling cotton seed was removing the most valuable elements of our soil, and gradually bringing sterility. Already we are beginning rotation of crops and production of livestock, which will result in maintaining fertility and even increasing productivity. No other country known to us has so many leguminous crops that thrive in winter and summer, that will give such bountiful harvest and so greatly enrich the land. The Experiment Stations of the University, the College of Agriculture, the Bureau of Agriculture and Immigration, the agricultural schools are doing good work in bringing our people to a knowledge of the value of these crops, when properly combined with cotton production. We believe that cotton must continue to be a leading money crop in this State, but in order to raise it profitably we must conserve the soil fertility, and produce crops that will add humus to the soil, for aiding in the conservation of moisture, so that the crop will not be checked in its growth by dry weather.

Last year we had one-third of a million acres in rice and produced over 400,000,000 pounds of grain. The yields per acre have been gradually decreasing and the profits of the industry diminishing. Many complex problems are involved in the perpetuation of this industry under the most profitable conditions. A race experiment station has been established at Crowley through the generosity of the Crowley people, who donated sixty acres of land and $3,500 in money to inaugurate the work. Adequate provisions should be made by the State for equipment and maintenance of this station for the study of those problems.

It was largely through the experiment stations demonstrating the value of rice bran and rice polish as feed stuffs that the price has constantly advanced, until a handsome revenue is now obtained from what was once a waste product.

Last year we had the largest acreage in corn known in the history of Louisiana, nearly two millions of acres being devoted to this crop. The statistics of the National Government and those of our State department do not correspond in the total yield, but unquestionably the yield was the largest ever obtained. This increased yield per acre was largely due to two factors. First, to the fact that large fields in the alluvial lands previously devoted to cotton were planted in corn. Secondly, to the fact that better seed was used, more attention having been given to improvement of the crop through seed selection than at any time in our past history. Unquestionably the yield can be greatly increased by giving proper attention to the question of seed, of cultivation, of fertilization and the rotation of crops, such as are advocated by the various authorities of the State and of the progressive press. The work of the State and national forces in the organization of corn clubs and various organizations seeking to further the study of corn production should be encouraged in every way possible. The liberal premiums offered for the best corn exhibits at the parish fairs and at the State Fair have greatly stimulated the production of better corn. The liberal premiums offered this season by the Governor and other State officials and some of our Congressmen and public spirited men have aroused interest in corn production that will redound to the good of agricultural work in general. We can confidently believe that Louisiana may become an important corn-producing State. During the past year exhibits of Louisiana corn at Chicago, Omaha and other points where a large number of corn growers throughout the corn belt assembled, brought forth favorable comment from experts on every side as to excellence of quality.

During the past year our crop of sweet potatoes approximated a value of one and three-quarter millions of dollars, and our crop of Irish potatoes not less than three-quarters of a million dollars. No very accurate statistics are available for our truck crops, but it is safe to say that more than ten million dollars' worth of truck was shipped out of the State. It is stated by reliable parties that a million and a half dollars has been paid out this year at a single point on the I. C. railroad for strawberries alone. The truck business is rapidly growing and is already assuming an important place in our agriculture as a State-wide industry. The establishment of canning factories under proper plans and management for the preservation of materials that would otherwise be wasted will greatly add to the profits of this enterprise and enlarge the territory where profitable trucking can be carried on.

We have at this time in the State approximately 200,000 milk cows, valued at $4,860,000, and about 480,000 other cattle, valued at $5,000,000. We have about 750,000 head of hogs valued at $5,000,000. No industry in the State is growing more rapidly than that of hog production. There is a pronounced demand throughout the State for the production of hog cholera serum, and we believe that provision should be made by the Legislature for the inauguration of a vaccine station, that this protective material may be obtained by the general public at a reasonable expense, so that the great losses from the plague of cholera may be averted. Great interest is also being manifested in the production of beef and dairy cattle, and we recommend that ample provision may be made for the Livestock Sanitary Board to take whatever measures may be necessary from time to time to protect our farm animals from infectious and contageous diseases.

The cattle tick is the conveyor of one of the most deadly diseases of the Southern States and causes probably greater loss than comes from any other one source to our live stock of cloven hoof. The experiment stations have worked out the complete life history of the cattle tick and have demonstrated plans for its eradication. Two parishes in the State have now been working on the eradication of the tick for sometime, and it is estimated that more than 80 per cent of the territory of these two parishes is now free from this pest. Certainly, provision ought to be made by the Legislature for a continuation of this splendid work. The Legislature of our sister State of Mississippi has recently appropriated $40,000 to its livestock sanitary board for the eradication of the cattle tick and other diseases of farm animals. The United States Government has made liberal appropriation for this work and is co-operating with the various States wherever appropriations are made for it, and is withdrawing assistance from those States that do not help in the work.

We believe that when the people properly understand the enormity of the losses sustained through this disease, there will be a State-wide movement for the eradication of the cattle tick.

The investigations of the agricultural experiment stations of the country and other scientific institutions have resulted in the accumulation of a vast amount of scientific information that is of practical value in the conservation of the soil fertility, in the improvement of strains of livestock and of plants, in the utilization of feed products, in the proper handling and application of fertilizer, in the control and eradication of diseases of animals and plants, that can be comprehended and assimilated by the school children of the country and farmers of limited education. We believe that the work that has been done in the organization of boys' corn clubs throughout the State has accomplished a great deal of good in awakening keener interest in agriculture in general, and corn in particular, and we believe that the ten agricultural schools have accomplished most excellent results thus far.

We believe that the effort to promote scientific study of agriculture should be encouraged in every practical way possible. The vast majority of boys and girls in the country districts do not pass beyond the 6th and 8th grades of our common schools. We believe that the public school course can be so arranged that within this very limited course, something can be given that will be of benefit to the man or woman who lives on the farm and what they may obtain through this very limited instruction that can be given, will stimulate a desire for further reading and investigation in the many lines that will be helpful to them. We We believe also that many boys and girls may be brought to a realization of the practical usefulness of scientific information and be held to the school for continued instruction, or even led to a college course, when otherwise they might stop at a period when they would be incapable of making a good living. The successful farmer of today must of necessity be fairly well educated, and the more thorough his preparation in the public schools the more readily he will be able to utilize the information obtained through reading and experimentation. We believe that every reasonable effort should be put forward to give the boys and girls of the State the foundation for practical comprehension of the fundamental principles of soil conservation and fertilization, crop production, plant breeding and selection, animal nutrition and breeding, some of the principles in the sanitary conditions of the home, the construction of farm buildings, the handling of farm machinery, the construction of good roads and the beautification of the surroundings.

Permanent progress in agriculture is essentially based on truth evolved through scientific research. The scientific problems involved in our complicated agriculture are not easily solved, and, while the experiment stations of the State University have rendered signal service in many lines, there is much investigation yet to be done and new problems are continually rising that need to be investigated; and we believe that the loyal support of all patriotic citizens should be given to all diligent effort to promote the science of agriculture as pursued by these institutions; and that they should receive liberal support from the public treasury, confidently believing that they will in the future, as they have in the past, give returns many fold greater than the expense of their maintenance.

With a soil formed largely from the deposits of rivers carrying the sediment washed from the best soils of the State of the entire Mississippi Valley, with a temperate climate and a rainfall that favors luxuriant vegetation of great diversity, including many legumes that positively enrich the soil, with all conditions favorable for the production of hogs, poultry, dairy products, beef and other livestock, with most of our soils so situated that erosion may be obviated, with unexcelled water transportation and excellent railroad facilities, we should become the most prosperous State in the South, if we educate our people to the proper understanding of, and interest in conserving the soil wealth that we have and the methods of putting it to the best possible use, in the production of those things that are conducive to the highest and most effective type of living.

Game and Fish

The conservation of the game and fish of the State has become a most momentous question. Unheralded and almost unrecognized, suddenly we find that the land and water of our State contains an almost priceless wealth in natural food supply, and it seems within the bounds of common prudence that we should develop this wealth to its greatest possibility.

At the last session of the General Assembly, bills were presented and subsequently became laws. In conformity with the provisions of one of those laws, a Bird, Game and Fish Commission was created. If it has accomplished no other purpose it has discovered sources of wealth of great richness, and divested of all other consideration, the simple fact remains that we must now make a decision of far-reaching importance regarding the future work to be done along these lines.

Either the State government, through a duly qualified department must boldly take hold of the proposition and make it a success, or we must let it drift as heretofore, subject to the fluctuating attempts of a few of the police juries to solve the problem.

Not only must there be adequate protection for the increase of our game animals, but provision must be made to conserve our water courses, our fish, fur-bearing animals, shrimp, diamond back terrapin and all forms of natural food supply.

It is contemplated to erect fish hatcheries in various parts of the State wherever suitable locations may be found, so that the work of restocking our waters with various edible fish may be begun at once. This is a very important measure and one which will commend itself to every one. Game preserves should also be provided for. The whole subject of conservation of game and fish is now under consideration by the Legislature.

Suffice it to say here that these resources have never been considered an asset in computing the wealth of the State. The time has come when they should be. A fair estimate of their present value indicates an immense sum, running into many millions, and capable of being developed four or five times greater. It is the deliberate opinion of those acquainted with the subject that if these natural resources were to be developed as they should be, they would bring an annual income to the people of the State in an amount equal to either the sugar or cotton crop. With the most wonderful water formation in the world, Louisiana can be made to furnish the fish for forty millions of people, according to the estimate of the Fish Commission; with the most fertile land formation, together with the greatest food supply for game, fur-bearing animals and birds, together with great natural preserves, both in marsh and swamp, Louisiana can be made a veritable hunter's paradise. We have practically a monopoly of shrimp, and by development along scientific lines, this industry should be rapidly increased, and probably run to one hundred million pounds per annum. The exploitation of our shrimp by the people of other States, fishing for shrimp in the waters of Plaquemines and St. Bernard, and also the Chinamen at Barataria Bay should be licensed in order that this State receive a revenue, as it appears not entirely just to the people of this State to permit her natural resources to be taken by citizens of other States and countries without direct remuneration for the privilege.

The fur-bearing animals of this State produced to the trappers of the State about four millions of dollars this season. The diamond back terrapin can be made a very valuable asset of the State. The protection of the non-game and insectivirous birds should be protected in justice to the agricultural interests of our State, which has suffered such vast losses from insect pests.

Inasmuch as the Legislature has before it the printed report of the Game and Fish Commission, we will not go further into this subject.

We will only say here what we have elsewhere said in this report, and that is, that it is the theory of the conservationist that those who take from the natural resources of the State owe the State not only that revenue which is placed upon all occupations and operations alike, but an additional amount, to be fixed by the wisdom of the Legislature, for the privilege of taking that which is the property of the whole State, and in which they had no hand in producing.

The Oyster Industry

The oyster industry during the past year has enjoyed a healthy and expansive growth, and while the general business depression throughout the country has affected the canner, preventing him from disposing of his output, still a great many acres of water bottoms were leased for oyster culture and other improvements were made.

There are now under lease and cultivation 14,391.24 acres of water bottoms at $1.00 per acre per annum, and yielding on an average of two hundred barrels of oysters per acre.

There were 2,771 boats engaged in the oyster industry and 2,385,042 bushels of oysters were caught during the last season with a market value of $1,908,033.60.

The present Oyster Commission of Louisiana was created by Act No. 153 of 1902 by the General Assembly and amended by Act No. 52 of 1904, and Act No. 178 of 1906, and Act No. 167 of 1908, and Act No. 201 of 1908, for the purpose of encouraging, protecting, regulating and developing the oyster industry in the State of Louisiana, by providing for the leasing of oyster bottoms belonging to the State, and the levying of taxes to derive a revenue from one of the State's greatest natural resources.

The law is administered by five commissioners, appointed by the Governor.

The coast line of Louisiana, bordering the Gulf of Mexico, comprise the ten parishes of Orleans, St. Bernard, Plaquemines, Jefferson, Terrebonne, St. Mary, Lafourche, Iberia, Vermilion and Cameron.

Their shores are largely indented with lakes, bayous and bays, where the tide ebbs and flows daily, mixing the salt water of the Gulf of Mexico with the fresh waters of the Mississippi river and the bayous and small rivers leading therefrom. The area of this water surface, susceptible to oyster culture, is calculated to be 4,720,502 acres.

There are now under cultivation 14,301.24 acres, producing about two hundred barrels per acre per year, and 62,740 calculated acres of natural reefs where oysters grow wild and unaided.

Deducting the leased bottoms and the natural oyster reefs from the total area above mentioned would leave 4,625,460.76 acres of barren bottoms, at present unproductive, but which, with the expenditure of money and labor, could be made to produce millions of dollars to the oyster business and thereby yield to the State an enormous revenue.

The present commission has, through its president, Judge L. J. Dossmann, inaugurated an entirely new system for the management of the industry; it has eliminated and changed such rules as were found inefficient and substituted others which will maretially advance the industry.

The commission has divided the oyster territory in three districts. The first district comprises all the water bottoms east of the Mississippi river; the second district that part lying between the Mississippi river and Bayou Lafourche, and the third district comprises that area extending from Bayou Lafourche to the Texas border.

The commission is policing these districts for the purpose of enforcing the provisions of the oyster law, by prohibiting the removal of small oysters and dead shells from the natural reefs; preventing the fishing of oysters from the natural reefs during the closed season (May 1st to August 31st), and of preventing any other infractions of the law. To do this the commission has inspectors equipped with boats, maintains two patrol boats in the first district, one patrol boat in the second district and one patrol boat in the third district.

The State has nearly six million acres of water bottoms, four million and a half acres of which are now barren and unproductive, but which could be made to yield at least 200 barrels of oysters per acre at but small expense.

The oyster industry of Louisiana offers to the people one of the greatest fields of exploitation and development.

The Bureau of Fisheries of Washington, D. C., through its representatives, have been making extensive examinations and researches in connection with the oyster industry, and the following extract is taken from a recent report (Baylor):

"The State of Louisiana has at present an extremely valuable and comparatively unproductive asset in the ownership of her estimated oyster territory of 4,631,152 square acres. It is the property of the people of the whole State. The highest acre of land in your State has to be taxed to protect your lowlands. Your expensive levee systems will have to be strengthened and enlarged. Your common school system will demand larger State expenditures, if your State hopes to compete with the great manufacturing States. Your highways must be improved if you would build up the remote sections of your State. Large sections of your oyster area can only be utilized in one of two ways. Either, under a community of interest, the State must authorize large sums of money to be spent in oyster culture for the benefit of those of her citizens who live adjacent to them, or else she must rent or sell these barren oyster areas to individuals or companies.

''The State of Louisiana has a princely inheritance in her more than four million acres of tidal bottom. It will require persistent labor, intelligence and capital to properly utilize and develop this area, and, more than all, wise laws judiciously administered.''

Forestry

In the early part of 1910, with the assistance of an appropriation of $250 from the office of the Register of the State Land Office and ex-officio Commissioner of Forestry, the government sent Mr. J. H. Foster, Assistant Chief of Co-operation of the United States Forest Service, to look over the forestry resources of Louisiana. Mr. Foster made an extensive report, covering some one hundred and twenty pages to the ex-officio Forester, containing a great deal of valuable information, from which source has been drawn liberally to prepare the report herein on forestry.

Investigation has shown conclusively that, notwithstanding the fact that the natural forest resources of Louisiana are probably greater than any other State east of the Pacific coast, unless the methods of management, particularly of the cut-over lands are improved, there will be very little hope for valuable yield of timber after the present merchantable forests are exhausted. The most urgent need is for fire protection on the cut-over pine lands. This is so important that if it alone could be guaranteed, there would be little cause for anxiety concerning the future timber supply.

With a total stand of pine in Louisiana of about forty-two billion feet and an annual cut of over two billion feet, the present standing pine will be exhausted in only a little more than twenty years. The commercial supply of cypress will be exhausted in a comparatively few years. The available hardwood forests are more extensive than in any other State, but the cypress and much of the best oak and ash have been culled from the parishes of Northern Louisiana, and the most valuable remaining tracts are in the hands of a few individuals, companies and syndicates. Much of the great alluvial region will be cleared for cultivation as soon as drainage systems are more fully perfected.

These conditions emphasize the urgent need for the Legislature to take up at once for consideration the problems involved in order that the forest growth on lands chiefly valuable for timber purposes may be perpetuated.

The chief purpose of investigation should be to suggest a forest policy which should provide for a permanent supply of timber for the people. This involves two propositions. Conservation of that which we have, and renewal of that which is consumed.

In order to achieve these ends, the forest must be regarded the same as any other crop. The young timber should be preserved and protected from fire. The old timber should be carefully cut and protected from fire. These views will be met with little interest at present from the majority of land owners, for the simple reason that they see trees all around them, and in every direction, and they have little thought that the time may come when this product will be exhausted. They have always had plenty of timber, *ergo*, they always will have plenty of timber.

To teach land owners is a problem of education. Indeed, education is one of the chief ends of conservation boards and commissions, for the reason that regulative legislation cannot be had without public opinion favoring it; and besides a healthy public opinion on the proper conservation would do a great deal that legislation cannot do.

AVERAGE LOSS BY FIRE IN LOUISIANA.

No accurate estimate can be made of the fire loss in matured timber in Louisiana at this time, as there are no statistics covering the question. But it would be safe to say that perhaps there is an annual damage done to matured forests in the yellow pine region of 4 per cent.

The damage done on the sprouting timber on the cut-over lands practically amounts to total extinction.

QUANTITY AND VALUE OF FOREST LANDS.

In accordance with the returns compiled from each parish in the State the acreage of total standing yellow pine timber for the year 1909 was 4,116,800 acres, of an average value of $10.75, and of a total value of $44,204,009; 520,123 acres of cypress, of an average value of $12.90, equal to $6,249,912; of hardwood, 4,343,744 acres, of an average value of $3.52, total $15,318,224. From these figures it appears that the total standing forest acreage in Louisiana in the year 1909 was returned as 9,386,855 acres, of an average value of $6.76, totaling $63,475,696. It is to be frankly stated that assessments in Louisiana are made on a 50 per cent basis. It is further to be stated that there are tens of thousands of acres of more or less timbered farm lands, which are returned as farm lands; so true is this fact that it may be fully estimated that 20 per cent of the more or less timbered lands of the State are not included in the above figures. But on the basis calculated above and giving the true wealth of the resources above in its full valuation, it is equal to $125,000.-000. It would be perfectly just to add $25,000,000 further as the value of the farm timber, making a total value of $150,000.-000 for timber and timbered lands.

The total amount of denuded timber lands returned in 1909 was 4,814,746 acres, at an average value of $1.58 per acre, at a total assessed value of $7,610,424. These figures show that there is half as much denuded lands in Louisiana as there is standing timber land, but that the denuded land is assessed at about one-ninth of the amount that the standing timber land is assessed at.

Is not this a proof of the fact that the lumberman is the greatest destroyer among all the industrial operators? He is from the necessities of his business, daily destroying taxable values, and it cannot be clearly shown that these taxable values are being replaced by either farms of other taxable property. In truth the taxation of the lumbermen should be different from that of all other enterprises.

ESTIMATE OF BOARD FEET OF STANDING TIMBER IN LOUISIANA.

Mr. Foster, the forestry expert, sent into Louisiana as above stated, by the government, after examining all available sources of informathion, including the returns made by the lumber companies to the assessors for taxation, reports that there is forty-three billion feet of pine standing, and ten and one-half billion feet of cypress and tupelo, and twenty-two and one-half billion feet of hardwood, of various classes; gum, oak and ash prevailing.

In 1906 the lumber cut in Louisiana was 2,790,000,000 board feet, and in 1907 it was 2,970,000,000. The decrease from 1907 to 1908 was 8.4 per cent, due to the fact of hard times upon the lumber industry.

Louisiana has been outranked only by Washington in the total cut of lumber since 1905. Since 1904 Louisiana has occupied the first place in the yellow pine industry.

A statement showing the lumber cut in 294 principal mills of Louisiana during 1909 has recently been compared by the American Lumberman. The total output from the 294 mills, 2,911,000,000, practically equaled the total output of all the mills in Louisiana in 1907, which would indicate that there was probably cut in Louisiana nearly three and a quarter billion board feet measure of timber in 1909.

It might be stated incidentally, in passing that before the passage of the national homestead laws, when the public lands were disposed of indiscriminately at $1.25 per acre, thousands of acres of the best cless of the timbered lands were purchased by farsighted persons. This practice of gathering up immense areas of timber land received its initial stimulus from Northern lumbermen, who saw the end of the great pine forests of the Lake States and invested in Southern timber. Following the general exhaustion of Northern pine, companies were organized in the South, and the yellow pine industry became a most important one. Immense holdings changed to the possession of lumber companies. Great fortunes in the lumber business have been made, largely from the speculation in stumpage, accompanying the rapid increase in its value. Within the last few years land syndicates and investment companies have worked diligently to gather together such great bodies of timber land as are not in the hands of operating companies. Some of the speculative holdings today aggregate hundreds of thousand of acres in Louisiana. While such lands are now being purchased at much higher prices than were paid by the saw mill companies, nevertheless the increase in future value of stumpage will make these investments extremely profitable. The tendency to secure timber lands in immense holdings is constantly increasing, and this applies to all classes of timber. The uplands of North Louisiana have been exploited for many years and the ownership of the timber lands in that section, and also in Southeast Louisiana, is practically confined to large land syndicates.

The holdings of the present operators are almost invariably heavily bonded, in some cases, as much as two dollars for every thousand feet of standing timber. As a consequence, it is necessary for the manufacturer to cut his timber in order to pay the interest on these bonds, which is usually from 5 to 7 per cent. One of the effects of this situation is that many companies are actually compelled to leave on the ground to decay as much as two thousand board feet per acre in tops and logs partially affected with red heart, because there is no profit in manufacturing low grades into lumber. The tendency is to haul to the mills only such portions of the trees as will make high grade material. The lumbermen believe that they are not in the position to consider conservative methods of logging or to look forward to a future cut of timber on the same land.

The above facts are commented on not only for the purpose of showing one of the causes of economic waste, but to meet the oft-repeated statement by the lumbermen, that if his tax were less, he would not produce so rapidly nor waste so recklessly, and that as a consequence the taxable values in timber would be left standing for a much longer time.

We will not permit ourselves to be deluded into the belief that the present reckless exploiting of the timber resources would be in any measure retarded by a reduction in taxation in view of the fact that the fixed charges on the investment must be met, and that these are far and away larger and more important in the eye of the lumbermen than the tax charge.

It seems inevitable that the reckless exploitation must continue as long as there is sufficient virgin timber to keep in operation the extensive establishments of the present time. The lumbermen, however, are not without responsibility to the people of the State. They have obtained their lands at low prices and have made fortunes from the increase in the value of the stumpage. Through their operations the pine timber, which is the chief asset of the region in which they operate, is being removed, and the land usually left in a desolate condition. The industry does not develop the country permanently, and the earnings are seldom invested where they are of any benefit to the community. Local residents, attracted by work which furnishes them with regular wages, leave the farm for the mills, and when the mills are abandoned they are too often not satisfied to return to the farm work, but follow the mills to other sections not yet exploited.

Nevertheless, a great deal of this cut-over land is fine for agricultural purposes, and when the proposition is made to reforest, especially when made to the private owner, he answers that he cannot afford to grow any trees on land which would produce as much as a half bale of cotton per acre annually, worth thirty dollars or over.

The only answer necessary to this statement is that until the lands can be put into cultivation, it ought to be put to some profitable use, and the most reasonable is the growth of young timber. There should be no hindrance to the development of agricultural interests, but there is no excuse for lands lying idle, for in the future there is a chance to bring it into profitable cultivation. A young growth of pine on the entire denuded area of Louisiana, would, in no way, interfere with the development of agriculture. On the contrary, the value of such land would be greater to any prospective farmer, for he could then keep portions not timbered which he did not wish to cultivate. To make these lands produce young pine timber it is only necessary to keep out fire for a number of years after the young trees have started. No other forest problem begins to be so important as fire protection.

FOREST FIRES.

The forest fire problem is of importance chiefly on the cut-over portion of the long leaf pine regions and the uplands of Northern Louisiana. In the virgin pine forests fires do little damage, unless the trees have been boxed, and there frequent recurrence prevents great conflagrations. It is on the cut-over pine lands that the injurious effects of fire call for the most careful consideration.

The seedling of any species is destroyed when not over two feet high. There are many damages besides absolute destruction which growing timber suffers from fire, but which will not be here gone into in detail. Fire also replaces pine timber by scrub oak. This is to be seen on any of the cut-over pine lands in Louisiana. This is caused by the destruction of the pine seedlings which did not sprout after being killed; whereas scrub oak sprouts from the stump after each fire and gradually encroaches on the pine. Even if the pines are not replaced by scrub oaks, the thinning of the thicket causes an open mature stand. The loss is at first due to the decreased grown yield and consequently to the formation of knotted and short butt trees, which lower the grade and value of the lumber.

The solution of the fire danger lies fully as much in prevention as in control. Even among land owners there is not a sufficient appreciation of the damage resulting from fire, especially to young growth; while the general public is indifferent to it. While a great many of our fires originate from locomotives, yet most of them originate from carelessness and from people burning their brush land, or from campers or hunters, and occasionally from a careless smoker.

To restrict and confine the fires to areas where annual burning may be safely carried on requires the development of a State protective system, backed by every intelligent person in the State, with wardens who will enforce, under the direction of a competent State official, the laws enacted with this particular end in view.

The disposal of brush would be of great benefit in reducing the fire danger on cut-over land. On the national forests in the West, where logging operations are directed by the government, brush disposal by piling and burning or by scattering, forms an important part of the operation.

Perhaps at the present time great difficulty would be experienced in attempting to enforce or supervise any provision for brush disposition over large areas like the long leaf pine and upland regions of Louisiana. Yet, nevertheless, it is well to keep in mind the important fact that the disposal of brush would greatly reduce fire, in order that when the proper time arrives this feature of prevention can be taken care of.

Aside from the loss by fire there is a great economic waste under present logging methods, and there is even a considerable waste at most of the mills. Probably this waste cannot be at this time restricted by legislation.

FOREST REPRODUCTION.

Few lumbermen consider the possibility of a second cut of pine on their land, and as before stated, they are rather looking to the agricultural development of these lands, no matter how long delayed, for their profit, rather than to forest renewal.

It may be said, however, particularly in the case of those operators who have before them fifteen or twenty years of operation, that it is probable that the increase in stumpage value in the meantime will more than justify the care of young stands. Investigations of the cut-over condition in different places of long leaf pine lands have shown interesting results.

It is not generally realized that in many long leaf pine forests fully one-fourth of the area is covered with thrifty young timber less than 14 inches in diameter. Much of this young timber is destroyed by the usual logging methods, especially where steam skidders are used. While it is true that some of the heart trees 12 or 14 inches in diameter are as old and have reached their maturity as completely as the timber 24 inches and over, it is generally the case that a large proportion of these small trees are vigorous sap trees. These small trees are developing slowly underneath the larger timber, but when healthy and full-crowned they grow rapidly when the overtopping trees are removed.

In several instances in Texas and in Louisiana, where the timber marked for removal consisted in timber over 14 inches in diameter, and considerable timber of small size which gave little promise of increase in growth, the result showed that an average of about seventeen hundred feet would be left on each acre. The growth of this crop for twenty years, and not allowing for accelerated growth after logging, added to the amount of timber at present too small to be cut, gave a total for the second crop at the end of twenty years of thirty-four hundred feet per acre. Lands left in this condition, if protected from fire, would rapidly become restocked with pine sapplings which would form the basis for a third cut if the land is not to be used for agricultural purposes.

Under such conditions, it is not unreasonable to anticipate a yield of from two thousand to twenty-eight hundred feet per acre at the end of twenty years, where from four hundred to five hundred board feet per acre have been left after the first logging.

The value of reproduction on cut-over land is, of course, prospective, but the effort which should be made to obtain this reproduction is based on the fact that land covered with young pine is far more valuable than the desolate cut-over land of the present time.

TAXATION.

It is within the legitimate of scope of tax laws to encourage the growth of timber for the purpose of insuring a timber supply for the future needs, and by protecting water sheds of navigable and unnavigable streams.

In this connection it is generally recognized by those who have studied the subject that the correct principal of forest taxation is to separate the timber from the land for purposes of assessment, tax the land annually according to its value without the timber, and then levy a tax of from 10 to 15 per cent upon the timber when it is cut. Such a system, however, should be applicable only to growing timber and should become effective as mature forests are cut over. This system is advocated by the "Forest Service," and doubtless before many years will be in operation in many of the States.

Such a system could not be inaugurated under the present laws of Louisiana, and it is submitted to the Legislature whether or not it may be wise to change the laws of the State as to encourage the growth of young forests by private owners.

FOREST RESERVES.

Perhaps in view of the fact that the private owner is presently intent on drawing his profits from mature timber, the State should take the lead in the matter of forest renewal. Therefore a provision should be enacted into law that the Conservation Commission should be permitted to accept gifts or donations of land, or even purchase land whenever possible, to be administered as a forest reserve not only as an example to private owners as to what might be done in this respect, but as a matter of preserving, or creating a supply of timber for future needs.

CONCLUSIONS AND RECOMMENDATIONS.

A PRINCIPLE.

(1). It is the opinion of the Louisiana Conservation Commission that he who severs, and profits by the exhaustion of, the Natural Resources of the State, in the creation of which he had no hand, should, in addition to the common burden of the expense of government, borne by all alike, bear an additional burden of taxation, the proceeds to go toward replacing either the resource which he has removed, or if that be impossible, toward renewing one which by its nature is renewable.

Hence, it is recommended that a system of taxation be inaugurated whereby the State may acquire a fund from the depletion of its Natural Resources, to be used in their restoration.

FORESTRY.

(1). Protection of cut-over pine lands from fire is the most important forest problem in Louisiana, and in connection with a forest policy for the State, should receive immediate attention.

(2). Forest owners should endeavor to prevent all forms of waste in logging, such as injury to the young growth, the use of valuable timber where inferior timber would answer the purpose, the leaving of sound logs in the woods and the cut of high grade stumps.

(3). Louisiana should establish State Forest Reserves, as many other States have done, from gifts and by purchase, and from lands already in its possession, whether this be a possession of grant by the government, or possession acquired of lands adjudicated to the State for non-payment of taxes.

(4). The system of taxation on young growing forests whose values are only prospective, is unjust, and should eventually be corrected.

(5). The system of taxation on mature timber should be changed so that a tax could be collected on the manufacture thereof, the proceeds to be applied to the conservation of that resource.

(6). To these ends a Department of Forestry should be created under the direction of competent foresters, with such assistance as may be required, to be paid from the fund herein above referred to.

MINERALS.

(1). There should be strict laws enacted to prevent economic waste in the extraction of minerals, particularly with reference to natural gas

To that end there should be created a Department of Minerals, under the direction of a Supervisor of Minerals, with competent assistance, the expense of such department to be borne from the fund herein above first referred to. No hope can sensibly be entertained of law enforcement by those not specifically charged with it.

AGRICULTURE.

(1). The soil is Louisiana's greatest Natural Resource. Its conservation, by retaining it, by husbanding and maintaining its fertility, and by promoting its cultivation, requires more scientific knowledge than may be acquired by uninstructed practice in the fields.

To that end the diffusion of agricultural education and training in the common schools, by lecture, and by demonstration, is strongly recommended.

WATER.

Reference is made to the report under this head.